



National Competency Standards for “Digging Operation Supervisor” (Operational Supervisor) Level-5



**National Vocational and Technical Training Commission
(NAVTTTC) Government of Pakistan**



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INTRODUCTION

Digging Operation/Excavation is one of the booming industries of Pakistan. There is an increasing demand of Assistant Digger Operator. Therefore, the skills are required to be inducted in the future generation. If an individual is planning to pursue a career in construction, this program will be helpful in targeting various industries including mechanical, electrical, automobile, hydraulics, etc. If an individual is planning to take up Assistant Digger Operator, this course will help him/her weigh their choices better.

Keeping in view of the above the competency based national vocational qualifications have been developed by NAVTTC to train the unskilled human resource on the technical and entrepreneurial skills to be employed / self-employed and inevitably set sustainable impact on their lives by increase in their livelihood income.

Training Course is based on competency standards which are defined by the industry and the traditional role of a trainer changes and shifts towards the facilitation of training. A trainer encourages and assists trainees to learn for themselves. Trainees are likely to work in groups (pairs) and all doing something different. Some are doing practical tasks in the workshop, some writing, some not even in the classroom or workshop but in another part of the building using specialist equipment, working on computers doing research on the Internet or the library. As trainees learn at different pace they might well be at different stages in their learning, thus learning must be tailored to suit individual needs. The following facilitation methods (teaching strategies) are generally employed.

PURPOSE OF THE QUALIFICATION

The purpose of the training is to provide skilled manpower to improve the existing construction industry. This will improve the quality in different industrial sectors by



Assistant Digger Operator and the availability of skilled professionals will bring socio-economic benefits to all stakeholders. The specific objectives of developing these qualifications are as under:

- Improve the professional competence of Assistant Digger Operator
- Capacitate the local community and trainers in modern CBT training, methodologies and processes as envisaged under NVQF
- Provide flexible pathways and progressions in the mining sector.
- Enable the trainees to perform their duties in efficient manner
- Establish a standardized and sustainable system of training Assistant Digger Operator in Pakistan

DATE OF VALIDATION

This national vocational qualification (NVQ) has been validated by the Qualifications Development Committee (QDC) in 08th to 12th November, 2021 and will remain in currency until 20th Jan 2023/2024.

*Shall be reviewed after 3 years



CODE OF QUALIFICATION

Qualification Title	Code
National Vocational Certificate Level 5, in (Digging Operation Supervisor) "Operational Supervisor"	724DOT07

ENTRY REQUIREMENTS

- For National Vocational Certificate Level-5 in "Technician" (Digging Operation Supervisor), the entry requirement is award of National Vocational Certificate Level-4 in "Digging Operation Supervisor".



QUALIFICATIONS DEVELOPMENT COMMITTEE

The following members participated in the qualification development of these qualifications:

Sr. No.	Name	Designation	Organization
1.	Shahzad Ahmad	Director	SS&-C, NAVTTC HQ
2.	Mehwish Aisha Ahsan	DACUM Facilitator	CBT Expert/Certified Assessor
3.	Muhammad Faraz Haider	Instructor, Mechanical	CTTI Islamabad
4.	Sikander Mehmood	Instructor, Mechanical	CTTI Islamabad
5.	Muhammad Rizwan Sarwar	Sr Instructor	GTTI Sheikhpura)
6.	Saif Ullah Khan	AD, Technical	PITAC, Lahore
7.	Sajid Mahmood	Site Incharge	National Construction Co, Lahore
8.	Engr. Abdul Basit Mansoor	AFM Civil	PITAC, Lahore
9.	Engr. Muhammad Ibrar	Manager Site,	DHA Bahawalpur
10.	Engr. Ameer Khusro	Site Supervisor,	Makson, Peshawar
11.	Engr. Rebab Maria Mehmood	Site Engineer	IMC Engineering & Consultants, Lahore
12.	Engr. Norheen Amina	Project Coordinator	Allied Engineering Services, Lahore
13.	Tahir Mahmood	GTTI Mughalpura	Lahore
14.	Dr Amjad Hussain	AP, Mechanical	UET, Lahore
15.	Dr Shahid Imran	HOD	Mechanical, UET, Lahore



QUALIFICATIONS REVIEW AND VALIDATION COMMITTEE

The following members participated in the qualification development of these qualifications:

Sr. No.	Name	Designation	Organization
1.	Shahzad Ahmad	Director	SS&-C, NAVTTC HQ
2.	Mehwish Aisha Ahsan	DACUM Facilitator	CBT Expert/Certified Assessor
3.	Aqsa Saleem	CBT Assessor	GCU, Faisalabad
4.	Mr Shahzad Zafar	Master Trainer/Ex DD	PTEVTA, Lahore
5.	Muhammad Younas	Master Trainer/Ex DD	Staff training College Lahore
6.	Engr. Muhammad Ibrar	Manager Site	DHA Bahawalpur
7.	Engr. Jamal Akbar	Associate Professor, Mechanical Department	GCT Peshawar
8.	Engr. Tashiq Semab Amin	Dy Manager,	HIT Taxila
9.	Mr. Tahir Shah	Assistant Secretary	TTB Peshawar
10.	Engr. Usama Ahmed	Assistant Track Engineer	Orange Line, Lahore
11.	Engr. Nohman Ahmad	Great Drilling Co	Iraq
12.	Syeda Fatima Iqbal	System Analyst	PBTE
13.	Israr Ahmed	Secretary	BTE, KPK
14.	Syed Mansoor Ahmed	Assistant Manager IT, NVQF Registry Incharge	SBTE Sindh
15.	Humaira Kanwal	Assistant Professor	University of Lahore, Lahore



SUMMARY OF COMPETENCY STANDARDS

National Vocational Certificate Level 5, in (Digging Operation Supervisor) "Operational Supervisor" (12 Months)								
Code	Competency Standards	Level I	Theory		Practical		Total	
			C	Hr.	C	Hr.	C	Hr.
1.	A- Develop Project Management Life Cycle	5	4	40	6	60	10	100
2.	B- Develop the Project Plan	5	8	80	12	120	20	200
3.	C- Supervise on-Site projects	5	6	60	24	240	30	300
4.	D- Plan the Project in Primavera P6	5	6	60	9	90	15	150
5.	E- Create Technical Documentation	5	5	50	10	100	15	150
6.	F- Develop entrepreneurial skills	5	4	40	6	60	10	100
7.	G- Practice Professionalism	5	7	70	13	130	20	200
Grand Total			40	400	80	800	120	1200



Competency Standard A: Develop Project Management Life Cycle - 724DOT07A

Overview: This competency standard deal with learning the competencies needed to develop Project Management Life Cycle. That includes performing operations for initiation of project, supporting project planning and design processes, assisting with project control and execution and Assisting with project finalization-closure. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Perform operations for initiation of project	<p>You must be able to:</p> <p>P1. Prepare documents for project.</p> <p>P2. Establish relationship between the project and broader organisational strategies and goals</p> <p>P3. Document project objectives, outcomes and benefits</p> <p>P4. Establish the project governance structure-Induct requisite staff.</p> <p>P5. Drafting a project charter for approval- feasibility report.</p>
CU2. Support project planning and design processes	<p>You must be able to:</p> <p>P1. Support breakdown of project objectives into achievable project deliverables</p> <p>P2. Identify project stages, and key requirements for stage completion-resources, standards, and communication.</p> <p>P3. Identify project milestones and map clearly against time and objectives</p> <p>P4. Consolidate associated plans and baselines in project management plan</p> <p>P5. Get approval of project plan</p>
CU3. Record and update project logs	<p>You must be able to:</p> <p>P1. Maintain and update records against project deliverables and plans at required intervals</p> <p>P2. Prepare status reports on project progress and identified issues</p>



	<p>P3. Assist with undertaking an impact analysis of proposed changes to the project</p> <p>P4. Maintain relevant project logs and registers accurately and regularly to assist with project audit</p> <p>P5. Update associated plans to reflect project progress against baselines and approved changes</p>
CU4. Coordinate with project planning team	<p>You must be able to:</p> <p>P1. Assist project finalisation activities with concerned person</p> <p>P2. Prepare finalised project specifications</p> <p>P3. Prepare a report of project performance to assist with project review assessments</p>

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- Objectives and functions of project management
- Different stages and activities involved in construction projects i.e. planning stage, designing stage, tendering stage and execution stage.
- Types of civil engineering projects
- Classification of works -original, major, minor & petty work, annual repair and special repair works.
- Parties/persons involved in a construction project- scope of duties & responsibilities of construction team
- Importance and role of each member of construction team
- Project management life cycle i.e. project initiating, planning, execution and project closer.
- Organizations i.e. line staff, direct and functional organization, their features, merits and demerits giving merits and demerits of each
- Engineering departments of government
- Organizational chart of C&W department Irrigation & power department, public Health Engineering department



- Duties of different officers of works departments
- Power of sanction of various officers of works departments
- Classes of establishments in works department
- Essential qualities of project Manager

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

1. Perform operations for initiation of project
2. Support project planning and design processes
3. Assist with project control and execution
4. Assist with project finalization-closure



Competency Standard B: Develop the Project Plan - 724DOT07B

Overview: This competency standard deal with learning the competencies needed to develop the Project Plan. That includes the individual activities, determine the sequence of those activities, draw a network diagram, estimate the completion time for each activity, level the resources, apply constraints, identify the critical path (longest path through the network), and update the CPM diagram as the project progresses. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Specify the individual activities	<p><i>You must be able to:</i></p> <p>P1. Collect data from estimation of construction project.</p> <p>P2. Identify pre-construction tasks.</p> <p>P3. Identify time dependency of activities- Dummy activities.</p> <p>P4. Divide the work into smaller parts.</p> <p>P5. Define the activities depending on resources.</p> <p>P6. Prepare the list of activities along with normal duration</p>
CU2. Determine the sequence of the Project activities	<p><i>You must be able to:</i></p> <p>P1. Identify the activities of construction project.</p> <p>P2. Find out predecessor and successor of each activity.</p> <p>P3. Arrange them in sequence.</p>
CU3. Draw a flow diagram	<p><i>You must be able to:</i></p> <p>P1. Represent each activity with arrows.</p> <p>P2. Draw ellipse/ circles at start and end of activities.</p> <p>P3. Observe the direction of arrows.</p>
CU4. Estimate the completion time for each activity	<p><i>You must be able to:</i></p> <p>P1. Examine the resources for each activity.</p> <p>P2. Estimate the workability of workforce</p> <p>P3. Examine the productivity of machinery.</p> <p>P4. Determine the activities normal duration.</p> <p>P5. Write down time required to complete each activity.</p>
CU5. Prepare Project Time Management plan	<p><i>You must be able to:</i></p>



	<p>P1. Perform forward pass by formula at each project activities.</p> <p>P2. Write Early Start Time (EST) and Early Finish Time (EFT) for each activity.</p> <p>P3. Perform backward pass by formula at each project activities.</p> <p>P4. Write Late Finish Time (LFT) and Late Start Time (LST) for each activity.</p> <p>P5. Level the resources of project.</p> <p>P6. Apply constraints due to resources, time, environment, and season.</p> <p>P7. Calculate float/ slack time for each activity.</p> <p>P8. Decide the critical path of project- activities with zero float/ slack time.</p> <p>P9. Calculate the duration of project for completion.</p>
CU6. Expedite/crash progress of project	<p>You must be able to:</p> <p>P1. Enhance workforce and machinery for activities.</p> <p>P2. Enhance daily working hours.</p> <p>P3. Assess the impact of each activity on project cost.</p> <p>P4. Calculate revised critical durations for activities.</p> <p>P5. Calculate time for completion of project.</p>
CU7. Update the CPM diagram as the project progresses	<p>You must be able to:</p> <p>P1. Record actual time duration on flow diagram</p> <p>P2. Calculate the actual cost.</p>

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. Therefore he/she must be able to:

- Objectives of scheduling
- Break down of the constructions work in to activities
- Procedure of making constructions schedule i.e. Sequencing and time computation of each activity



- Need for material, equipment and labour schedule
- Methods of procurement of labour, materials and equipment
- Bar chart-time and progress chart Gantt chart
- Bar chart and explain its limitation
- Advantages of project planning by network analysis (only with critical path method)
- CPM. network for a construction project
- Network time, critical path, free float and total float
- Work progress charts.
- Progress network/ charts for a construction project
- Network and crash programming
- Resource scheduling and levelling.
- Characteristics, operations and safety of construction machinery
- Cost of owning and operating construction machinery
- Main factors in selection of construction machinery
- Productivity of different construction machinery, e.g. Bulldozer, excavator, etc.

Critical Evidence(s) Required

The candidate needs to produce any or all of the following documents/evidences:

1. Draw Network diagram showing critical path
2. Perform Levelling of resources
3. Update Network diagram showing critical path



Competency Standard C: Supervise on-site projects - 724DOT07C

Overview: This competency standard deal with learning the competencies needed to conduct on-site supervision of projects. You can propose site, prepare contract documents, prepare Working Drawings, draft Specifications, Design of RCC slabs, lintels, T & L beams, columns and column footings, prepare estimates- Cost, Materials, Time (labour, machinery), layout Structures and conduct Planning for project for framed structure class room. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Determine quality requirements	<p><i>You must be able to:</i></p> <p>P1. Determine quality objectives, standards and levels, with input from competent authority as per Quality Management Plan</p> <p>P2. Establish Quality Management methods, techniques and tools Identify quality criteria from a competent authority and communicate to stakeholders</p> <p>P3. Ensure clarity of understanding and achievement of quality and overall project objective</p> <p>P4. Implement agreed quality requirements in the project plan and performance measurement</p>
CU2. Implement Quality Assurance Processes	<p><i>You must be able to:</i></p> <p>P1. Measure results of project activities</p> <p>P2. Check product performance throughout the project life cycle as per quality standards</p> <p>P3. Identify causes of unsatisfactory results, in consultation with client</p> <p>P4. Recommend appropriate actions to competent authority for quality outcomes</p> <p>P5. Conduct inspections of quality processes and quality control results as per quality standards</p> <p>P6. Maintain a Quality Management System (QMS) for effective communication of quality issues</p>



CU3. Perform Project Defect Analysis (PDA)	<p><i>You must be able to:</i></p> <p>P1. Implement agreed changes in project life cycle to ensure continuous quality improvement</p> <p>P2. Review project outcomes against project success criteria</p> <p>P3. Identify project drawbacks</p> <p>P4. Recommend improvement</p>
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Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

- Need for inspection of works
- Duties of various inspecting officers
- Quality management theory, techniques, tools and methodologies
- Roles and responsibilities in project management- sub-engineer regarding works, store and account
- Use off site order book
- Principles of supervision
- Need and methods of quality control
- Points to be considered in enforcing specifications
- Necessity for sampling and testing of materials
- Methods for managing and improving performance
- Relevant legislation codes and national standards:
- Award and enterprise agreements and industrial instruments
- Construction industry codes of practice
- Legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination.

Critical Evidence(s) Required

The candidate needs to produce any or all of the following documents/evidences:



1. Demonstrated evidence of successfully managing project staff so that quality outcomes were achieved on multiple complex projects
2. Knowledge of a range of quality management tools, techniques and methodologies.



Competency Standard D: Plan the Project in Primavera P6 - 724CO11H

Overview: This competency standard deal with learning the competencies needed to develop portfolio for industry. You can perform internship. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Perform Basic operation in Primavera P6	<p>You must be able to:</p> <p>P1. Load & unload primavera P6 Software</p> <p>P2. Prepare interface of software</p> <p>P3. Customize P6 Screen Layout</p> <p>P4. Display Gantt Chart</p>
CU2. Perform Project Activities Scheduling in Primavera P6	<p>You must be able to:</p> <p>P1. Add Project in Primavera</p> <p>P2. Create WBS of project in Primavera</p> <p>P3. Create Activities of project in Primavera</p> <p>P4. Create Relationships between activities of project in Primavera</p> <p>P5. Create Schedule of activities of project in Primavera</p>
CU3. Perform Project Resources Costing & Planning in Primavera P6	<p>You must be able to:</p> <p>P1. Add constraints of activities of project in Primavera</p> <p>P2. Create Calendar for activities of project in Primavera</p> <p>P3. Assign Calendars to activities of project in Primavera</p> <p>P4. Add Resources to activities of project in Primavera</p> <p>P5. Assign Resources of activities of project in Primavera</p> <p>P6. Add Cost of activities of project in Primavera</p> <p>P7. Analyse Resources of activities of project in Primavera</p> <p>P8. Perform Baseline process for Project</p>
CU4. Manage Project in Primavera P6	<p>You must be able to:</p> <p>P1. Status the Project</p> <p>P2. Prepare Mitigation plan of the project</p>



Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- Physical performance to Customized screen layout.
- Activity Constraints,
- Work calendar, work/non-work days, working hours
- Roles and Hourly Rates,
- Baselines and describe their use in evaluating project performance
- Stages of project execution
- Project monitoring and control

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

1. Managed Project - project progress, planned baseline, Resource levelling and describe its purpose, comparison graphically, project progress for a specified time period



Competency Standard E: Create Technical Documentation - 724DOT07D

Overview: This unit describes the performance outcomes, skills and knowledge required to create technical documentation that is clear to the target audience and easy to navigate.

Unit of Competency	Performance Criteria
CU1. Identify and analyse documentation requirements and client needs	<p>You must be able to:</p> <p>P1. Consult with client to identify documentation requirements</p> <p>P2. Interpret and evaluate documentation requirements and confirm details with client</p> <p>P3. Investigate industry and documentation standards for requirements</p> <p>P4. Define and document the scope of work to be produced</p> <p>P5. Consult with client to validate and confirm the scope of work</p>
CU2. Design documentation	<p>You must be able to:</p> <p>P1. Identify information requirements with reference to layout and document structure</p> <p>P2. Create document templates and style guides consistent with information requirements</p> <p>P3. Conduct a review of the system in order to understand its functionality</p> <p>P4. Extract content that meets information requirements according to copyright restrictions</p> <p>P5. Develop the structure of the technical documentation giving focus to the flow of information, style, tone and content format</p> <p>P6. Validate the technical documentation structure with the client</p>
CU3. Develop documentation	<p>You must be able to:</p> <p>P1. Write technical documentation based on the template</p>



	<p>and scope of work using the information gathered</p> <p>P2. Translate technical terminology into plain English where appropriate</p> <p>P3. Apply content format and style according to documentation standards and templates</p>
CU4. Evaluate and edit documentation	<p>You must be able to:</p> <p>P1. Submit technical documentation to appropriate person for review</p> <p>P2. Gather and analyse feedback</p> <p>P3. Incorporate alterations into the technical documentation</p> <p>P4. Edit the technical documentation for technical and grammatical accuracy</p>
CU5. Prepare documentation for publication	<p>You must be able to:</p> <p>P1. Check that the completed technical documentation meets client requirements and scope of work</p> <p>P2. Submit the technical documentation to appropriate person for approval</p> <p>P3. Prepare the technical documentation for publication and distribution using appropriate channels</p>

Knowledge and understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- Content features, such as clarity and readability
- Document design, web design and usability
- Functions and features of templates and style guides
- Instructional design principles
- Organizational policies, procedures and standards that cover document design.

Critical Evidence(s) Required

The candidates need to produce following critical evidence(s) to be competent in this



competency standard:

1. Establish customer needs
2. Design and develop technical documentation, such as system, procedures, training material and user guides, incorporating appropriate standards
3. Update document with client feedback
4. Prepare documentation for publication.



Competency Standard H: Develop Entrepreneurial Skills - 724DOT07E

Overview: This Competency Standard identifies the competencies required to develop entrepreneurial skills by Mosaic Artist, in accordance with the organization's approved guidelines and procedures. You will be expected to develop a business plan, collect information regarding funding sources, develop a marketing plan and develop basic business communication skills. Your underpinning knowledge regarding entrepreneurial skills will be enough to provide you the basis for your work.

Unit of Competency	Performance Criteria
CU1. Develop a business plan	<p>You must be able to:</p> <p>P1. Conduct a market survey to collect following information</p> <ul style="list-style-type: none"> • Customer /demand • Tools, equipment, machinery and furniture with rates • Raw material • Supplier • Credit / funding sources • Marketing strategy • Market trends • Overall expenses • Profit margin <p>P2. Select the best option in terms of cost, service, quality, sales, profit margin, overall expenses</p> <p>P3. Compile the information collected through the market survey, in the business plan format</p>
CU2. Collect information regarding funding sources	<p>You must be able to:</p> <p>P1. Identify the available funding sources based on their terms and conditions, maximum loan limit, payback time, interest rate</p> <p>P2. Choose the best available option according to</p>



	<p>investment requirement</p> <p>P3. Prepare documents according to the loan agreement requirement</p> <p>P4. Include the information of funding sources in the business plan</p>
CU3. Develop a marketing plan	<p>You must be able to:</p> <p>P1. Make a marketing plan for the business including product, price, placement, promotion, people, packaging and positioning</p> <p>P2. Include the information of marketing plan in the business plan</p>
CU4. Develop basic business communication skills	<p>You must be able to:</p> <p>P1. Communicate with internal customers e.g.: labour, partners and external customers e.g.: suppliers, customers etc., using effective communication skills</p> <p>P2. Use different modes of communication to communicate internally and externally e.g.: presentation, speaking, writing, listening, visual representation, reading etc.</p> <p>P3. Use specific business terms used in the market</p>

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

- 7Ps of marketing including product, price, placement, promotion, people, packaging and positioning
- 7Cs of business communication
- Different modes of communication and their application in the industry
- Specific business terms used in the industry
- Enlist the available funding sources
- Explain how to get loan to start a new business
- Explain market survey and its tools e.g.: questionnaire, interview, observation etc.
- Market trends for specific product offering



- Main elements of business plan
- How to fill the business plan format

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

1. List 7 Ps
2. List 7Cs



Competency Standard I: Practice Professionalism - 724DOT07F

Overview: This competency standard deal with learning the competencies needed to develop portfolio for industry. You can perform internship. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Develop Portfolio for industry	<p>You must be able to:</p> <p>P1. Select previous assignments for portfolio</p> <p>P2. Work on previous selected assignments for portfolio</p> <p>P3. Compile variety of assignments for portfolio</p> <p>P4. Make Professional Portfolio for industry</p> <p>P5. Develop Digital Portfolio for industry</p>
CU2. Perform Internship	<p>You must be able to:</p> <p>P1. Prepare for internship</p> <ul style="list-style-type: none"> ▪ Personal Presentation ▪ Portfolio Presentation ▪ Interview preparation <p>P2. Demonstrate Ethics for Internship</p> <p>P3. Identify Industry for internship</p> <p>P4. Perform Internship in Industry</p> <ul style="list-style-type: none"> ▪ Fill the Performa of Internship ▪ Report the performance of internship

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- Importance of portfolio
- Ethics for Internship

Critical Evidence(s) Required



The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Professional
- Portfolio



COMPLETE LIST OF TOOLS AND EQUIPMENT

SR#	Tools & Equipment	Quantity
1.	Computer Systems	26
2.	Scanner	1
3.	Printer	1
4.	Hardness Testers	1
5.	Universal testing machine(UTM)	1
6.	Impact Testing Machines	1
7.	Steel Rulers	10
8.	Tri Square	10
9.	Inside Vernier Caliper	10
10.	Odd leg Vernier Caliper	10
11.	Trammel Vernier Caliper	10
12.	Outside Vernier Caliper	10
13.	Vernier Depth gauge	5
14.	Vernier Bevel protractor	5
15.	Thread gauges	5
16.	Screw pitch gauges	5
17.	Fillet gauges	5
18.	Feeler gauges	5
19.	Vernier Height gauge	5
20.	Dial indicators with magnetic stand	5
21.	Vernier Micrometer	5



22.	Inside Micrometer	5
23.	Outside Micrometer	10
24.	Depth Micrometer	5
25.	Snap Gauge set	2
26.	Dial Bore Gauge	5
27.	Set of Adjustable Wrench	5
28.	Set of Spanners (Open end, Ring)	5 each
29.	Pipe wrench	2
30.	L-key sets	5
31.	Nose pliers	5
32.	Grip pliers	5
33.	Crawler Excavator	5
34.	Wheel Excavator	5
35.	Wrenches	5
36.	Pliers	5
37.	Screw driver (Positive and negative)	5
38.	Hammer	5
39.	Vice grip	5
40.	Grease gun	5 each
41.	Paint brush	10
42.	Steel brush	25
43.	Crawler Excavator	10
44.	Measuring tape	10



45.	High pressure washer	5
46.	Air compressor	5
47.	Rigid and articulated dump truck (Off road)	5
48.	Dump truck (On road)	10 set
49.	Hopper	10
50.	Conveyor	10
51.	Vernier caliper (out, inside)	5
52.	Torque gauge	5
53.	Steel rule	5
54.	Multi-meter	5
55.	Thermometers	5
56.	Spanner set	10 packs
57.	Socket set	1
58.	ST(special service Tool)	1
59.	Drilling Machines	1
60.	Location Determining Devices	1
61.	Digging slant determining devices	1
62.	Communication Devices	10
63.	Sample Boxes	10
64.	Exploration and Scanning Devices	2
65.	Drawing board	25
PPEs		
66.	Helmet	25



67.	Safety shoes	25
68.	Safety belt	25
69.	Cotton hand gloves	25
70.	Goggles	25
71.	Reflective jackets	25
72.	Safety Signs & Message boards	25
73.	Full body Harness	25
74.	Lanyard	25
75.	Anchorage	25
76.	Barricade tape	25
77.	Metal barricades	25
78.	Plastic cones	25
79.	Safety nets.	25
MATERIALS/LUBRICANTS		
80.	Engine oil	
81.	Gear oil	
82.	Hydraulic oil	
83.	Coolant	
84.	Grease	
85.	Nitrogen gas	
86.	Marking cloth	
87.	Spare parts	
88.	Machine parts	



89.	Boulders	
90.	Soil	
91.	Sand	
92.	Limestone	
93.	Debris	
94.	Coal	
95.	Landfill	
96.	Ore	
97.	Silt	